Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Advanced Television Systems	)	
and Their Impact Upon the	)	**MM Docket No. 87-268**
Existing Television Broadcast	)	
Service	)	
	)	
Fifth Further Notice of	)	
Proposed Rule Making	)	

COMMENTS OF ZENITH ELECTRONICS CORPORATION

July 11, 1996

TABLE OF CONTENTS

I. Introduction 1

II. The Commission's Proposal to Mandate Use of All Elements of the ATSC DTV Standard Is Essential 3

III. Protection from Interference 8

A. Emission Mask 8

B. Frequency Offsets 8

C. Power Measurements 9

IV. The ATSC DTV Standard Provides More than Adequate Interoperability with Alternative Media 9

A. Computer Interoperability 9

B. Aspect Ratio 11

C. Interoperability with Cable and Other Delivery Media 12

V. Other Issues 14

A. Receiver Standards 14

B. Licensing of Technology 15

C. International Trade 15

D. Captioning 16

VI. Conclusion 17

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COMMENTS OF ZENITH ELECTRONICS CORPORATION

I. Introduction

Zenith Electronics Corporation respectfully submits these comments on the Commission's Fifth Further Notice of Proposed Rule Making ("NPRM") in its Advanced Television ("ATV") proceeding. The NPRM seeks comment on the Commission's proposal to require digital television licensees to use the digital television ("DTV") transmission standard recommended to the Commission by its Advisory Committee on Advanced Television Service ("Advisory Committee"). This recommended standard is based on the Digital HDTV Grand Alliance system and has been documented and endorsed by the Advanced Television Systems Committee ("ATSC") and published as the ATSC Digital Television Standard.

A long-time leader in consumer electronics and cable technologies, Zenith has been actively involved in HDTV research since 1987. Zenith was one of the original proponents who submitted proposals to the Advisory Committee in 1988. Indeed, Zenith's proposal pioneered the concept of simulcasting high-definition television ("HDTV") broadcasts over the

previously unusable taboo channels during the transition to advanced television ("ATV"), permitting the Commission to conduct a transition to ATV without allocating any additional spectrum to television service, and paving the way for the eventual recovery of extremely valuable large, nationwide blocks of spectrum.

In 1989, Zenith joined forces with AT&T to develop HDTV technologies. In 1993, when the Digital HDTV Grand Alliance was formed with the encouragement of the Commission and the Advisory Committee, the Zenith/AT&T all-digital HDTV system was combined with three other digital systems to develop a best-of-the-best HDTV system. The Grand Alliance subsystems for digital transmission -- the eight-level vestigial sideband ("8-VSB") system for terrestrial broadcasting and the high-data-rate 16-VSB system for more robust channel environments such as cable (which provides twice the data rate as 8-VSB) -- are proven Zenith contributions that provide world-class performance for the Grand Alliance system.

Zenith is also a member of the ATSC and participated fully in the work of the ATSC and the Advisory Committee to develop formats for standard-definition digital television ("SDTV") to augment the Grand Alliance HDTV formats, and to help achieve the broad cross-industry consensus in support of the Advisory Committee recommendation now embodied as the ATSC DTV Standard.

Zenith joins in the extensive comments filed by the Grand Alliance and by the ATSC, and to amplify certain points, we submit these additional comments.

Zenith strongly supports the Commission's tentative decision to adopt the ATSC DTV Standard and to require digital broadcast licensees to use the full standard. Our considerable investments of capital and scarce R&D resources over the past nine years have been based on the Commission's commitment to adopt a single DTV standard based on the recommendation of its Advisory Committee. We believe it is vital for the Commission to adopt a single DTV standard as swiftly as possible in order to provide clear and certain ground rules for broadcasters, manufacturers and consumers. Moreover, we believe that the ATSC DTV

Standard offers world-leading digital technology with unprecedented flexibility and headroom for growth, and is the best possible standard to adopt, far exceeding the Commission's initial expectations for an ATV system.

We see three major benefits from the rapid adoption and implementation of the proposed standard. First, it provides broadcasters the only practical means for upgrading their service to digital technology, allowing them to make the quantum improvements in video and audio quality that will be essential for free over-the-air television to compete against other video delivery media in the years and decades to come. Second, implementing digital television, especially HDTV, will give consumers access to a host of other innovative information services, due to the generalized data delivery capability of the system and the high-resolution displays used to provide HDTV. Finally, it will permit the Commission to transition to a vastly more efficient utilization of television spectrum, recovering perhaps as much as 150 MHz of nationwide contiguous spectrum in the process.

Our nation has the world's best digital television technology in hand. All that remains is for the Commission to act promptly to approve the ATSC DTV Standard recommended by the Advisory Committee in order to unleash the investment that will bring the benefits of this technology to the American public.

II. The Commission's Proposal to Mandate Use of All Elements of the ATSC DTV Standard Is Essential

Zenith agrees with the other members of the Grand Alliance and the ATSC that a standard is required in order to provide the certainty and reliability necessary for broadcasters, manufacturers and consumers to invest in digital television; that a clear, unambiguous standard is necessary to provide a reliable and economic basis for the design of broadcast and consumer equipment; and that an FCC requirement *mandating* the use of the DTV standard by digital broadcast licensees is necessary to achieve these goals.

In the first place, mandating use of the DTV standard would not be a case of government imposing an unproven standard, but would be a matter of reinforcing an extremely broad industry consensus around proven, extensively tested, world-leading technology, thereby providing the certainty and reliability to allow all segments of the industry to move forward rapidly and confidently to implement the service.

Moreover, as the Commission has noted (NPRM at ¶36) and Commissioner Chong has reinforced in her separate statement, free over-the-air broadcast television service is a unique service upon which more than 98 per cent of Americans rely, either directly or indirectly, not just for entertainment, but for news and information. It is fundamental to the well-being of our democratic society and a unique part of our American culture.

When consumers purchase digital television receivers, they must be assured that those sets will operate properly, that they will receive all of the local channels, and that if they move across town or across the country, their investment will be protected. Without such assurances, consumers would be reluctant to purchase, and the whole transition to digital television would be prolonged or thwarted entirely, frustrating all of the Commission's major objectives in this proceeding, including the recovery of spectrum.

The NPRM (at ¶¶23-26) gives a detailed summary of its previous deliberations and actions regarding whether or not the Commission should set a single standard, demonstrating that the Commission has consistently intended to set a single standard and that such a course has enjoyed widespread support across the affected industries. Nevertheless, the NPRM highlights two "recent" developments that might arguably justify a different conclusion: first, the presence now of a single consensus standard might make it unnecessary to mandate a single standard; and second, the opportunity afforded by digital transmission technology for each licensee to offer a unique set of services might make it less desirable to require a particular standard. (NPRM, ¶¶27-28) The first point rather remarkably overlooks the fact that the Commission's clear intention to select a single standard was central in motivating the formation of the Grand Alliance, and in driving the industry to endorse the ATSC DTV

Standard. Removing the assumption that the Commission would mandate a single standard would threaten the industry consensus and inject a great deal of uncertainty, risk and delay that would jeopardize a swift transition to digital television and the rapid recovery of valuable television spectrum.

The second noted change, the development of an all-digital system, far from calling into question the Commission's earlier decisions to mandate a standard, actually strongly reinforces the wisdom of doing so. The all-digital system represented by the ATSC DTV Standard brings flexibility and extensibility undreamed of previously, so the Commission's earlier nagging concerns about an *inflexible* standard have been fully addressed. There is no real dilemma about mandating a standard, and the strong consensus view expressed in 1988 and adopted by the Commission in 1990 applies with greater force today.

Thus, the Commission's decision to require the use of a single broadcast standard is correct and essential. A mandated single standard will protect consumers, promote a swift transition, drive broadcaster and consumer costs down more rapidly, and allow the Commission to recover extremely valuable television spectrum as soon as possible.

Furthermore, Zenith believes that all layers of the ATSC DTV Standard should be adopted. The Advisory Committee and the ATSC have given careful consideration to what is essential in a standard, and have proposed the minimum essential requirements to provide broadcasters and equipment manufacturers the information and assurances they need, yet allow tremendous room for flexible use, and for product and service differentiation and enhancements. Any proposal to limit the mandated aspects of the standard to certain layers of the standard would inject uncertainty and unreliability, jeopardizing a smooth and rapid transition to digital television.

Zenith agrees with the other members of the Grand Alliance and the ATSC that the concerns expressed in the NPRM at ¶¶42-47 regarding the potential obsolescence of the DTV Standard are greatly exaggerated, and accordingly, we strongly believe that a sunset provision on the mandatory use of the ATSC DTV Standard is completely unnecessary and would

undermine the Commission's goal to promote a smooth and swift transition. Any suggestion now that the standard may soon become obsolete or superseded is wrong and would send inappropriate and counterproductive signals to broadcasters, manufacturers and consumers. We believe that the Commission can safely rely on its existing processes and on industry groups, including the ATSC and the Consumer Electronics Manufacturers Association, to identify any need for modifying the standard, including any proposal in the future to make its use nonmandatory.

The NPRM at ¶48 seeks comment on several alternative approaches to requiring the use of the full standard. Zenith believes these would not be effective, and urges the Commission not to consider them further.

Authorizing the use of the standard and prohibiting interference to it, but not requiring the use of it, would not provide the certainty and reliability that are necessary to justify the substantial investments required of broadcasters, manufacturers and consumers for the conversion to digital television. Consumers must be assured that when they purchase a digital television receiver it will deliver the full designed performance anywhere in the country, and that their receiver will not be rendered obsolete by incompatible changes in broadcast equipment. Likewise, broadcasters must have confidence that widely available receivers from all manufacturers will be compatible with the signals they transmit, and that incompatible improvements in receiver designs will not impair or prevent the reception of their broadcasts. Such a weak approach as this "allow, but don't require" option would not provide an adequate basis for design or purchase, and would likely render the transition to digital television stillborn and make it impossible for the Commission to recover valuable television spectrum.[1]

[1]The AM stereo radio example shows the folly of failing to establish a single clear standard. With AM stereo, rather than authorize a single standard, the Commission decided to permit multiple standards and rely on the marketplace to sort out the best approach. Early attempts at multi-standard receivers were abandoned by manufacturers due to the cost and difficulty of achieving adequate performance, and the service has never been successful, even though agreement on a single standard was finally achieved more than ten years later at the direction of Congress. In contrast to the AM stereo radio debacle, with FM stereo radio service the Commission established a single clear standard, and the service became an immediate success in the marketplace.

Adopting a standard for allocation and assignment purposes only, another possibility mentioned in ¶48, would be even worse than the "allow, but don't require" approach -- suffering all the same frailties, but worse yet, failing to guarantee that one user of the broadcast spectrum would not interfere with DTV broadcasts in adjacent spectrum or in adjacent geographical areas, or with NTSC broadcasts during the transition period. Such an approach simply will not provide the certainty and clear direction that are required to get mutually dependent broadcasters, manufacturers and consumers to make consistent and mutually reinforcing investment decisions.

Similarly, mandating the use of only some layers of the ATSC DTV Standard would also be an inadequate and ineffective approach. Throughout the nine-year Advisory Committee process, careful attention was paid to identifying what minimum aspects of the standard needed to be mandatory, and what could be left for differentiation and innovation in the marketplace. We believe the recommended standard strikes the right balance. While requiring only the RF/transmission layer of the standard theoretically would guarantee against harmful interference, it would not give broadcasters, manufacturers and consumers assurance that a reliable, consistent, and compatible nationwide digital television service would ever materialize, creating tremendous uncertainty that would stifle investment and probably render DTV stillborn.

The NPRM at ¶54 invites comment on the acceptability of the ATSC DTV Standard. We believe that this standard, based on the Grand Alliance system, is not only acceptable, it represents by far the world's best digital television system and has won remarkably broad support and acceptance throughout the affected industries. Lingering complaints by a few members of the computer and motion picture industries are not new issues and are not well-founded -- they have been discussed and debated thoroughly over a period of many years, and have not withstood the scrutiny of peer review in a consensus-driven process.

As discussed in more detail below, the ATSC DTV Standard is more easily interoperable, by far, with computers and telecommunications than any other digital television

service ever conceived -- due in no small part to the involvement of representatives of the computer and telecommunications industries in the Advisory Committee process over the last five years. In the NPRM at ¶54, the Commission correctly recognizes the unmatched capability and flexibility of the system and the collective genius of its many creators, properly notes the years of thoughtful consideration and expert research and development in an open process in which all interests were able to participate, and correctly concludes that the burden of persuasion should be on any who would oppose the Commission's decision to mandate use of the ATSC DTV Standard.

III. Protection from Interference

A. Emission Mask

At ¶56, the NPRM seeks comment on a specific rigid emission mask designed to limit the out-of-channel emissions from a DTV station transmitter. As the developers of the Grand Alliance transmission system, Zenith representatives played a central role in the discussions within the ATSC on this matter, and Zenith endorses the modifications to the Commission's proposal as recommended in the ATSC Comments. As fully explained there, if a rigid mask is adopted, we recommend a somewhat different specification than that proposed in the NPRM, but we believe that an even better approach would be to utilize an alternative mask based on a weighting function that can be determined from interference data collected at the Advanced Television Test Center ("ATTC").

B. Frequency Offsets

At ¶57, the NPRM seeks comment on a requirement for a precise frequency offset between the ATV pilot carrier and the color subcarrier of the lower adjacent channel NTSC station. Here again, Zenith representatives have been heavily involved in the industry deliberations on this matter, and we endorse the specific recommendations made in the ATSC Comments for the three cases that need to be considered.

C. Power Measurements

At ¶58, the NPRM seeks comment on proposals for specifying maximum power requirements and measuring actual power output. Again, Zenith representatives have been actively involved in the ATSC's consideration of this issue, and we endorse the recommendations contained in the ATSC Comments for a specification of allowed variation in average power as well as considerations for use of conventional instrumentation.

IV. The ATSC DTV Standard Provides More than Adequate Interoperability with Alternative Media

In the NPRM (at ¶62), the Commission requests comment on the Advisory Committee's conclusion that the ATSC DTV Standard provides adequate interoperability with alternative media, on whether any critical interoperability problems remain, and on what other actions, if any, the Commission might take to facilitate interoperability. Zenith is convinced that the ATSC DTV Standard provides *far more than adequate* interoperability with alternative media, that no critical interoperability problems remain, and that the Commission need not take any further actions to facilitate interoperability. As noted above, none of the objections raised by certain members of the computer and motion picture industries are new issues. They have been debated repeatedly and thoroughly, and addressed fully in the recommendation adopted without objection by the Advisory Committee members, including members of these industries. Moreover, the Advisory Committee recommendation enjoys a remarkably broad consensus, as further evidenced by the nearly unanimous vote by nearly fifty ATSC members to adopt the ATSC DTV Standard. In stark contrast, there is no consensus whatsoever for the counter-proposals offered by the few detractors of the proposed standard.

A. Computer Interoperability

Zenith fully endorses the extensive comments offered by the Grand Alliance and the ATSC on this topic, and we offer here additional insights on this subject. In the competitive phase of the Advisory Committee effort, Zenith and AT&T proposed and developed an all-

digital system using progressive scanning and square pixels, in part because of its easier interoperability with computers and telecommunications. When we believed that the winning system had to be either all-progressive or predominantly interlaced, we fought hard to make progressive scan the choice. The most important breakthrough in achieving an agreement to form the Grand Alliance and build a best-of-the-best system, however, was the finding that we could build a primarily progressive scan system, yet still support a 1,000-line, 60 Hz interlaced HDTV format as well with only very modest additional cost. Thus, by supporting multiple formats, the needs of a wide range of different users and different applications will be met simultaneously.

In combining the best interoperability features of the predecessor all-digital systems and also incorporating other changes required by the Advisory Committee, the Grand Alliance designed, built and tested by far the most interoperable broadcast television system ever conceived. The system's all-digital layered architecture, its packetized data transport structure, its use of headers and descriptors, its support of multiple picture formats and frame rates with a heavy emphasis on progressive scan and square pixels, and its compliance with MPEG-2 international compression and transport standards, give it unprecedented and unmatched interoperability with computers and telecommunications. Indeed, the ATSC DTV Standard based on the Grand Alliance system abundantly provides features to promote interoperability with computers and telecommunications, yet some in the computer industry want to *prohibit* features that *other industries* deem vital to promote interoperability with systems and equipment and archived program material used in *their* industries.

Zenith finds it extremely ironic that the proposed ATSC DTV Standard is the *only* digital television development effort in the world that stresses progressive scan and square pixels. If the Commission were to delay adoption of the Advisory Committee recommendation out of a concern over a limited amount of interlaced scanning, it would only serve to entrench interlaced scanning as the predominant mode for digital television throughout the world. Digital television systems and standards that exclusively utilize

interlace scanning and non-square pixels are beginning to proliferate throughout Europe and the rest of the world, including the United States, while some members of the computer industry attempt to derail the Commission's nine-year process at the last minute, ostensibly because the proposed transmission standard *permits some* interlaced scanning. Given these facts, we cannot help but wonder whether the true motive of these detractors is to offer up *any* objection -- no matter how groundless -- that might have a chance to derail this process, presumably to obtain some perceived future competitive advantage for themselves.

The Commission's overriding goal in this proceeding is to preserve and enhance free over-the-air television service, including the adoption of policies that will allow digital television infrastructure and applications to contribute to improving the National Information Infrastructure. The ATSC DTV Standard based on the Grand Alliance HDTV system has answered this challenge with the world's best digital television system, offering unmatched interoperability with computers and telecommunications, far surpassing the Commission's expectations when it initiated this historic process nine years ago.

B. Aspect Ratio

Some cinematographers have objected to the 16:9 aspect ratio included in the ATSC DTV Standard, saying that it will limit broadcasters' ability to display the full artistic quality of their work. The problem is that since cinematographers use a variety of aspect ratios, no one aspect ratio can be ideal for all motion pictures. Indeed, even now, there is no consensus among those dissatisfied with the 16:9 ratio as to what the ideal ratio should be. In addition, movies are not the only program material to be considered. An aspect ratio wider than 16:9 is not ideal for many other types of programming such as news telecasts and one-on-one interviews.

The complicated trade-offs involved in selecting an aspect ratio were thoroughly analyzed, and the decision to standardize on 16:9 for a wide-screen video aspect ratio was reached more than a decade ago after extended and careful deliberations with extensive participation by the motion picture and television production community. The 16:9 aspect

ratio has long since been adopted in a number of international standards bodies, and manufacturers around the world have been producing a variety of equipment in the 16:9 format for years. Changing the aspect ratio for broadcast DTV at this late date would increase costs to consumers, would cause unacceptable and unnecessary delays in implementing DTV service, and would severely damage many parties who have already made significant investments leading to DTV service. The Commission must not permit second-guessing of the aspect ratio decision ten years after the fact to delay or derail the swift adoption and implementation of the ATSC DTV Standard.

C. Interoperability with Cable and Other Delivery Media

In the NPRM at ¶64, the Commission seeks comment on whether the public interest would be served by Commission involvement to assure compatibility between digital broadcast standards and digital cable standards. Although the Advisory Committee's charter was to recommend a *terrestrial broadcast* ATV transmission standard, the easy interoperability of the broadcast ATV standard with cable TV systems has been from the beginning a key objective in the development of the Grand Alliance system and the ATSC DTV Standard. Throughout the Advisory Committee process, the cable industry has made significant investments and contributions to ensure the suitability of the standard for carriage over cable systems. A significant portion of the Advisory Committee's laboratory and field tests were conducted by Cable Television Laboratories, Inc. ("CableLabs") and focused on ensuring that the digital HDTV system developed for terrestrial broadcast would also meet the needs of the cable industry.

As a result of these objectives and concerns, the Grand Alliance transmission system developed by Zenith (as well as the ATSC DTV Standard based upon it) includes a 16-VSB high-data-rate mode which can be utilized by cable systems to deliver 43 Mbps over a single 6 MHz cable channel. This payload is more than twice that available over the less-robust terrestrial 6 MHz channels, so for example, *two* of the most demanding live-action HDTV sports programs can be carried simultaneously over a single 6 MHz cable channel. The high-

data-rate mode has demonstrated superb performance in extensive laboratory and field tests conducted by the Advisory Committee over the past three years, including field tests on eight different cable systems.

In light of the fact that approximately 60 percent of all television viewing in cable TV homes is of broadcast television stations, it is vital that the Commission assure that cable transmission and other video delivery methods are compatible with the broadcast DTV standard, i.e., that cable signals are compatible with ATSC-compliant receivers, based on known standards.

In the case of modulation, cable compatibility will be assured as consumer electronics manufacturers, Zenith among them, introduce cable-compatible DTV receivers that operate with both ATSC terrestrial 8-VSB and ATSC high-data-rate 16-VSB signals, and by Commission requirements that DTV signals on cable are to be "passed through" to the DTV receiver in ATSC-compliant 8-VSB or 16-VSB form. Ultimately, receivers and converters that perform both VSB and QAM demodulation may be feasible, but the situation is further complicated by the fact that at least four different mutually incompatible QAM approaches are presently being pursued for cable and MMDS services. Unless the cable industry can agree upon a single QAM approach, it is unlikely that a combined VSB/QAM demodulator can fill the requirement for universal cable compatibility in DTV receivers.

The industry faces complicated issues in assuring that cable and other delivery media customers receive the benefits of DTV broadcasts. As the Commission recognizes, it is in the economic interests of these providers and consumer equipment manufacturers to work out effective solutions to these issues. Zenith believes that as standards activities continue in the consumer electronics and cable industries, as well as for DBS, MMDS and ITFS services and for open video systems, the ATSC DTV Standard should provide the core of emerging standards in these industries. We believe that such an approach will promote the early availability of digital television, including HDTV, over all of these other media as well as terrestrial broadcasts, without causing undue burdens on cable operators or other providers.

V. Other Issues

A. Receiver Standards

In the NPRM at ¶66 the Commission asks whether it should require that receivers (and set-top boxes designed to receive ATV broadcasts for display on NTSC sets) be able to receive adequately all DTV formats. In comments on the Fourth NPRM, Zenith (as well as all other receiver manufacturers who filed comments) stated the belief that marketplace forces would dictate that all DTV receivers (and set-top converters) would be capable of *receiving* all DTV formats, without any Commission mandates, but that manufacturers should be allowed to implement various *display* modes in ways that respond to market demands and provide product differentiation.[2] Since last November when those comments were submitted, broadcasters have made crystal clear that they intend to transmit substantial amounts of HDTV programming over their DTV channels. It would be foolhardy for any manufacturer to offer digital sets in the marketplace that go dark for any programming, much less a substantial amount of broadcast programming. Consequently, it is unnecessary for the Commission to impose a requirement that all digital receivers and converters receive all of the formats in the ATSC DTV Standard.

Regarding other aspects of the reception performance of receivers, as the developer of the Grand Alliance transmission system, Zenith fully understands the concerns of broadcasters that predicted broadcast coverage areas cannot be achieved without adequate receiver performance. However, we have no doubt whatsoever that the same marketplace forces that operate today to ensure that television manufacturers provide adequate reception performance will continue to motivate us all to compete to provide high-quality receivers. Nevertheless,

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[2]At ¶66, the NPRM cites concerns that an all-format reception requirement might have a large effect on either reception quality or receiver costs, somehow attributing these concerns to Zenith and to the Electronic Industries Association and its Advanced Television Committee (EIA/ATV). In fact, neither Zenith nor EIA/ATV expressed any such concerns, but we both stated the belief that digital sets would receive all of the digital formats without any Commission mandates. (*See* Fourth NPRM Comments of Zenith at 4, and Comments of EIA/ATV at 15)

we intend to work with broadcasters through the recently formed ATSC Implementation Subcommittee to ensure that their concerns are met. If it is determined that minimum performance levels need to be established for DTV receivers, we believe they should be the subject of voluntary industry standards, and we would work with the ATSC and the Consumer Electronics Manufacturers Association to establish such standards, just as has been done with the current analog NTSC system for the past half century.

B. Licensing of Technology

As the Commission notes in ¶67 of the NPRM, the Advisory Committee made clear early in its deliberations that the proponents of any DTV system would be required to offer licenses under reasonable and nondiscriminatory terms for their intellectual property necessary to implement a standard based on their proposed system. Zenith has long supported the Commission's objective to make this technology broadly and rapidly available, and we and the other members of the Grand Alliance have given the ATSC written commitments to abide by this requirement. Although not covered by ANSI policies, pending patents necessary to implement the standard will be licensed under the same reasonable, nondiscriminatory terms. We believe no further Commission action is required to ensure easy and nondiscriminatory access to the intellectual property necessary for a rapid implementation of the ATSC DTV Standard.

C. International Trade

Zenith believes that the ATSC DTV Standard based on the Grand Alliance system represents the best digital television technology in the world, fully encompassing both HDTV and SDTV as well as a host of other potential applications, and offering unmatched interoperability with computers and telecommunications through its use of a packetized data transport structure and its emphasis on progress scanning and square pixels. We are anxious to make the benefits of this system available not only here in the United States but also to service providers and consumers in countries throughout the world. By far, the most

important thing the Commission can do to facilitate international compatibility and to promote export opportunities is to adopt the ATSC DTV Standard here in America as rapidly as possible.

Zenith is participating in initiatives by the ATSC to promote the use of the ATSC DTV Standard beyond the United States, especially throughout the Americas. However, while our superior system awaits final approval from the Commission, the European DVB system -- built upon all-digital technology pioneered here, but presently implementing only SDTV services that use interlaced scanning and non-square pixels exclusively -- has been adopted and its use mandated in Europe, is being intensively marketed around the globe, and has even been selected for use in some U.S. DBS services. Meanwhile, efforts to promote the ATSC DTV Standard around the world are stymied by the fact that it still has not been adopted for terrestrial television in the U.S. Notwithstanding the broad industry consensus supporting the ATSC DTV Standard, delays in obtaining FCC approval threaten to squander the technological lead that the U.S. fought so hard to achieve and to see the U.S. "re-leap-frogged" in exploiting this innovative American-born technology.[3]

D. Captioning

Zenith has been a leader in the provision of closed captioning capability in television receivers, introducing the first closed captioning-capable sets in 1991. Over the last several years, Zenith participated in the efforts of the Advisory Committee to work closely with the affected communities to ensure that closed captioning needs were fully addressed in the standard to be proposed to the Commission so that receiver manufacturers could reliably build

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[3]One bright spot has recently developed in this otherwise discouraging international scene. Following the Commission's tentative decision in this proceeding to adopt the ATSC DTV Standard, in June 1996, the Digital Audio/Visual Council ("DAVIC") selected the ATSC DTV video and audio specifications as the basis for the DAVIC 1.2 standard for "higher quality video and audio." DAVIC is a non-profit association based in Geneva, Switzerland, with more than 200 member companies in more than 25 countries, aimed at promoting the success of digital audio/visual applications and services based on specifications that maximize interoperability across countries and across applications and services. Further success in promoting the ATSC DTV Standard in DAVIC and in other international settings will require continued clear signals and expectations that the standard will indeed be formally adopted by the Commission for use in the U.S.

closed captioning capability into ATV receiver designs. We believe that the ATSC DTV standard provides all the capability necessary for broadcasters and receiver manufacturers to provide closed captioning.

VI. Conclusion

The ATSC DTV Standard based on the Grand Alliance HDTV system represents by far the world's best digital broadcast television system, with unmatched flexibility and unprecedented ability to incorporate future improvements. Implementing this technology will bring consumers quantum improvements in the technical quality of free over-the-air television, and give them access to a host of potential innovative information services as well. Moreover, a swift transition to digital broadcast television will permit the Commission to move to a vastly more efficient utilization of television spectrum, recapturing huge amounts of invaluable nationwide, contiguous spectrum in the process.

Now is the time for the Commission to act, to follow through on its commitment made to industry repeatedly over the past decade to set a new broadcast television standard. Zenith strongly urges the Commission to adopt the full ATSC DTV Standard without further delay, and to mandate its use by digital broadcast licensees. In so doing, the Commission will provide the clarity, certainty and stability required by financiers, broadcasters, manufacturers

and consumers to unleash the further substantial investments necessary to bring the benefits of this fertile technology to the American public and to spread those benefits throughout the world.

Respectfully submitted,

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July 11, 1996